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THE YEAR IN REVIEW

A month-by-month recollection of 1973 as seen in the public and private record.

January

Syncrude prepares a financial analysis to present to government and draws up applications to the Alberta Energy Resources Conservation Board for the construction of a power plant and technical revisions to its original plan.

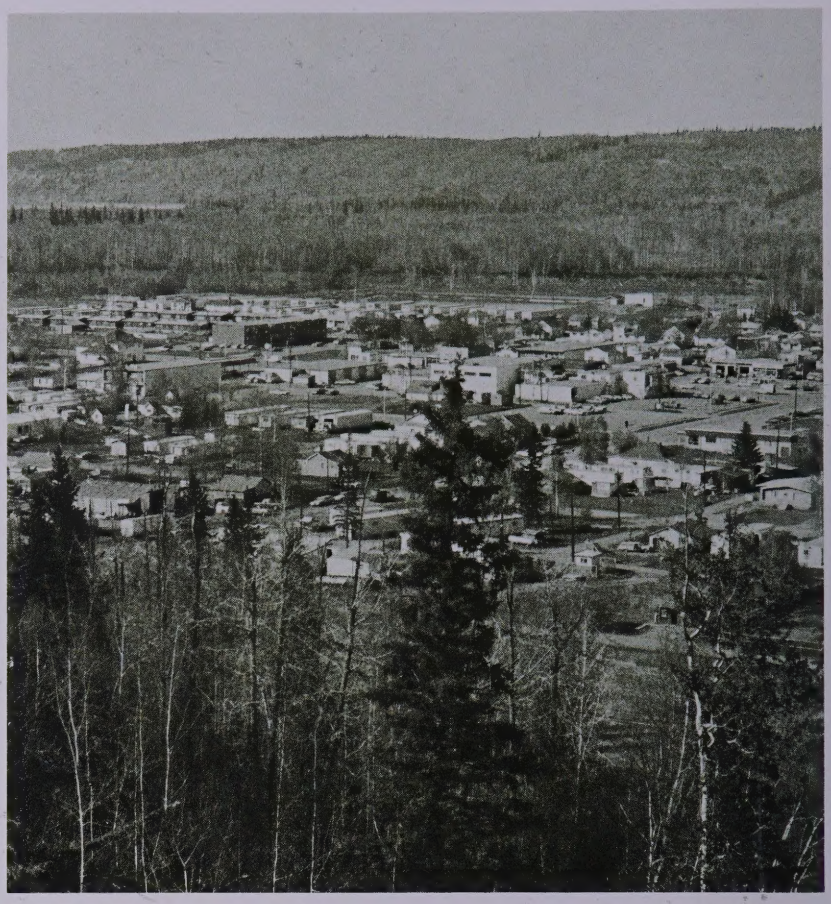
The Alberta Department of the Environment announces new and more stringent regulations limiting atmospheric emissions. The permissible ground level concentration of SO_2 is reduced from 0.3 parts per million to 0.2 parts per million, and acceptable emission level of particulates drops from .85 pounds for 1,000 pounds of flue gas to 0.2 pounds. Syncrude officials are confident that such conditions have already been met in their planning.

The Edmonton Journal announces that the final decision on the $650 million project is to be made August 31.

February

Fort McMurray residents prepare for the expected Syncrude decision with a meeting on the problems and prospects of expansions. Their expectations are confirmed by a report entitled "The Impact of a Proposed Synthetic Crude Oil Project on Fort McMurray". This study has been commissioned to Reid, Crowther and Partners by Syncrude and covers all aspects of social and economic impact. The oil export curb from the federal government is called, in the newspapers, "a boom to oil sands" and the Edmonton Chamber of Commerce is quoted in Oilweek as warning about the risk of investment in the tar sands.

Contracts are awarded to three Alberta Engineering firms: Monenco Consultants Ltd., Edmonton, for the engineering of the power plant; Mon Max Services Ltd. of Calgary to prepare a process design package for amine treating facilities; and Carswell Engineering Ltd., Calgary, for the design of the buildings on the project site.



Fort McMurray

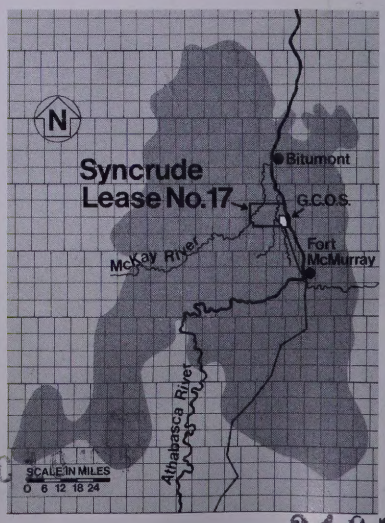
March

The Syncrude Environmental Affairs Group presents the first of a series of research monographs to the Minister of the Environment, who tabled "The Habitat of Syncrude Tar Sands Lease No. 17: An Initital Evaluation" in the Alberta Legislature. He also tables the first draft of the "Syncrude criteria", a set of environmental guidelines to be followed by the company.

The question of royalties is a prime concern of negotiations between the company and the province, with the government proposing a formula providing a rate of return which Syncrude finds unacceptable on an economic basis.

The Oil Sands Environmental Study Group is beginning to take shape under the guidance of the Alberta Department of the Environment and the chairmanship of Syncrude's environmental co-ordinator, Jim Nalbach.

Two seminars are held to discuss the findings of the Reid, Crowther report. Syncrude Public Affairs personnel hear the reaction of senior civil servants in Edmonton and of municipal officials and interested individuals in Fort McMurray. Water is discovered pouring into Syncrude's test mining pit north of Fort McMurray on Beaver Creek.



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Premier Lougheed announces that, contrary to previous government thinking, policies dealing with Great Canadian Oil Sands and Syncrude will be dealt with individually before a full provincial tar sands policy is formulated.
The Japanese and the U.S. governments are reported interested in development of the tar sands. William Dickie, Minister of Mines and Minerals, confirms that August 31 remains the deadline for a Syncrude decision, in a story in the Calgary Albertan.

April

An environmental study of Beaver Creek, the main water-course on Syncrude's lease No. 17 is produced by the company's Environmental Affairs Group and tabled in the legislature by Mr. Yurko.
The Alberta Energy Resources Conservation Board hears Syncrude's applications to construct a utilities plant to supply the project with power and steam; to make some technical alterations in the processing procedures; and to extend the period of construction for one year, with production start-up by January 1, 1978, to decrease pressure on peak manpower requirements.
The Integ Report, "An Environmental Study of the Athabasca Tar Sands", makes a number of recommendations, most of which have already been included in Syncrude's environmental protection plans. Most of the remainder do not apply to the project.
Syncrude launches its first archaeological expedition to investigate possible historic sites on the lease so that these can be marked, studied and preserved.

May

The provincial government states a sincere desire to have the project proceed and proposes to Syncrude a royalty formula and a proposition for public participation. The royalty formula is found unsatisfactory and Syncrude makes a counter proposal which is, in its turn, rejected by the government.
The Toronto Globe and Mail runs a story stating that the problems between government and Syncrude have been resolved, which brings a quick denial from the company.
The provincial government suggests the public participation and royalty formulae be presented to the oil industry for comments and Syncrude agrees.
A summer student is hired by Syncrude to survey the availability of government assistance programs to Fort McMurray. A company team visits the northern community to conduct a survey on the housing situation.

June

The Oil Sands Environmental Study Group holds its first press conference and issues its first news release, outlining the objectives and purposes of the group.
Syncrude's survey of housing in Fort McMurray shows accommodation to be woefully inadequate for the present situation, without even taking into effect the impact of the Syncrude project.
In a meeting with government, Syncrude lists fourteen major concerns which exist over and above the royalty and public participation issues. These include housing, labour availability, and material and equipment shortages.

Premier Lougheed, according to the Toronto Globe and Mail, is confident that all issues can be settled while the Financial Post asks if the royalty problem will put the entire project into jeopardy.
On the technical side, the plan to use trains to transport tar sand to the separation plant is replaced by one which utilizes conveyors.
The Globe and Mail announces that, for the first time, the tar sands have been included in the Energy Conservation Board's inventory of proven oil reserves in Alberta.

July

The government proposes that the decision date be moved to October 31 but, because of the many construction difficulties such a delay would create, Syncrude asks it to reconsider.
The August 31 date is retained.
Syncrude provides government with a final revision of cost estimates to assist in the decisions on royalty and public participation.
The government returns a royalty proposal acceptable in formula but requiring some modifications, which the company provides for government approval.
The Alberta Department of the Environment issues to Syncrude permits to construct the plant and requests a study on the impact of the project on the environment.
The Edmonton Journal reports that August 31 has been set as the deadline on what is now described as a $750 million project.

August

The government's latest proposal on royalty and public participation proves less acceptable economically to Syncrude than previous propositions. This triggers further meetings, including one between Premier Lougheed and the Chief Executive Officers of Syncrude's four participating companies.
An Order in Council extends the decision date from August 31 to September 18.
The Edmonton Journal reports that the $800 million decision is expected soon.

September

The Alberta Energy Resources Conservation Board issues approval of Syncrude's plans for a power plant, extension of construction time and technical changes only days before Premier Lougheed, on province-wide television, announces a formal agreement between Syncrude Canada Ltd. and the Government of Alberta. The agreement remains subject to satisfactory federal tax and pricing rulings and assurance of labour stability during the life of the project.
The Town of Fort McMurray declares September 24 to be a civic holiday.
The Edmonton Journal announces the start of the $1 billion project.
The Committee for an Independent Canada and the New Democratic Party accuses the Alberta government of selling out provincial resources.
The formation of the Alberta Energy Company is announced as a vehicle which will give Albertans the opportunity to share in the Syncrude project.
ATCO Ltd. of Calgary is awarded a contract to build a 500-man, $891,000 construction camp at the Syncrude site. This will be the first phase of a camp to accommodate some 3000 workers.

Hon. Peter Lougheed, Premier of Alberta

October

Men and machines move onto the site to begin clearing muskeg in preparation for construction.
Canada Manpower announces it will handle the dissemination of information on the Syncrude project to those seeking employment.
Syncrude hosts a citizens' forum on the environmental impact of the project on Fort McMurray and area. About 60 concerned persons from the locale attend.
Syncrude teams begin seeking suppliers of major plant components, and ordering of equipment is accelerated.
The Toronto Globe and Mail reports Syncrude is considering a second plant based on the results of the first operation.

November

The federal and provincial finance ministers agree that taxation problems must not be permitted to stop the Syncrude project, while the oil export tax jumps to $1.90.
Ottawa denies a story that the federal government plans to take over development of the tar sands.
The provincial government extends one month the deadline under which Syncrude must have a settlement of its tax problems with the federal government.
The company announces its intention to proceed with the use of draglines for its mining operation.

December

Syncrude signs a letter of agreement with the federal government, resolving the tax situation.
Syncrude begins ordering the giant draglines for the mining operation.

II. PEOPLE

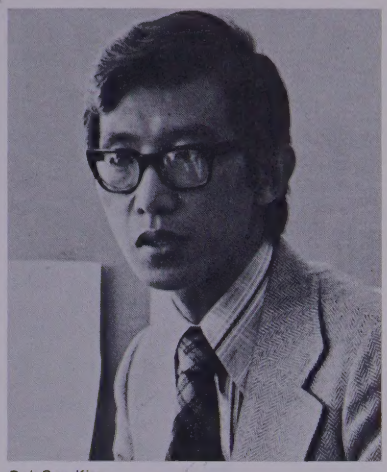
How to produce synthetic oil from the tar sands? It's a uniquely Canadian problem. In 1973, Syncrude made big strides in assembling an organization — solidly Canadian, with just a pinch of international spice — to solve it.

Most of Syncrude's people are Canadians. Some, like engineer Al Hyndman, have roots in Canada that go back four or five generations. Some, like company President Frank Spragins, are men who came here from other lands and became Canadians by choice. By deliberate policy, the company always looked for Canadians first; and by the end of 1973, its staff was 95% Canadian.

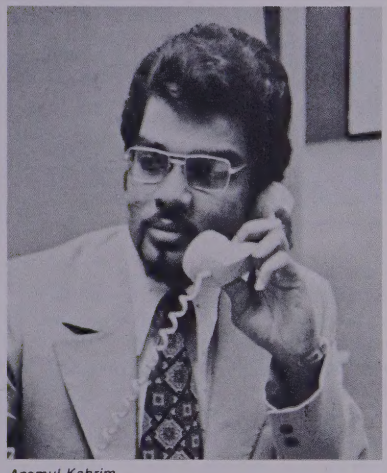
But the search for the many specialized skills needed to unlock the secrets of the tar sands couldn't stop at the borders of Canada. Syncrude's personnel director, Don Scott, gave two reasons: "First, there is a general shortage of engineers in Canada, a reported 500 vacancies in Alberta alone; second, some of the specialists we need are very few in number in Canada and are being pursued by many other companies as well. This meant we also had to recruit abroad."

Steven Rose

Employment co-ordinator Grant Howell participated in two recruitment drives in England, at one time conducting interviews by candlelight in London during power shortages and bomb scares. "The scope of this organization is really something," he said. "Some of the men we have hired in other parts of Canada, or abroad, had to be sent immediately to Syncrude assignments in contractors' offices in other countries."



Duk Sun Kim



Azamul Kahrim

Merle Rudiak

The recruitment drive in England brought Syncrude several Britons including engineers Steven Rose, (who went immediately to Fort McMurray as the company's assistant construction manager — upgrading), and Richard Brewer. The growing organization added representation from many corners of the globe — process engineer Duk Sun Kim, from Seoul, South Korea, via Honolulu, Tokyo, San Francisco and Toronto; project engineer Julio Escobar, from Chile; extraction engineer Fred Scheybeler, from Sumatra, Indonesia, via Holland, Niagara Falls, Fort McMurray and Edmonton; and engineer Azamul Kahrim, from Trinidad.

The recruiting campaign brought Syncrude people from all parts of Canada, as well: mining engineer Bob Caines came to the company from a job in Labrador City.

Nor did Fort McMurray fail to make a contribution: Ms. Merle Rudiak, whose grandfather was a trapper in the area, joined the company's community relations staff in December. She grew up in Fort McMurray when it was a remote bush town with a population of fewer than 1,000 people.

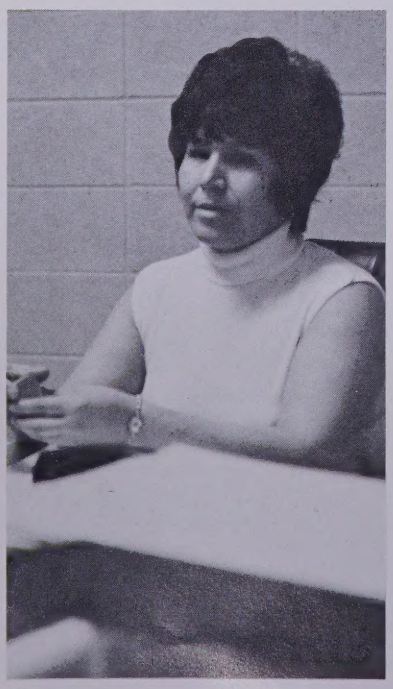
FORT McMURRAY

For most of its long and colorful life, Fort McMurray was a community on the edge — the edge of the North, and the edge of great things to come. The town was situated at the confluence of two great northern waterways, and in the centre of the vast Athabasca tar sands. But while it was able to realize some of its potential as a northern transportation centre, for many decades McMurray was unable to capitalize on the tantalizing potential of the tar sands. Like the tar sands, McMurray had to wait.

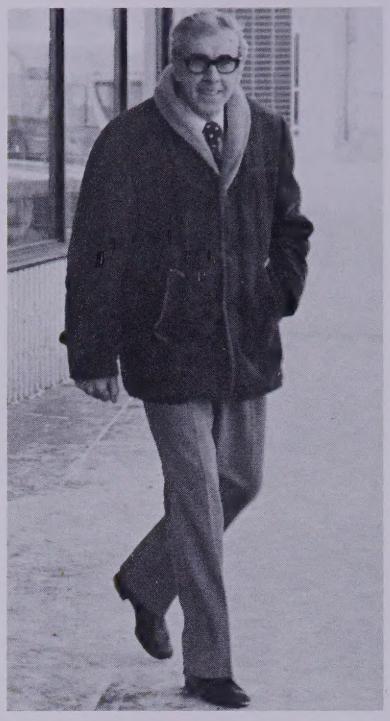
Chuck Knight

David McNeilly

Those long decades of waiting finally seemed to be ending in 1964 when Great Canadian Oil Sands began building the first commercial tar sands plant. But the completion of GCOS in 1967 brought a slackening of activity, and another uncertain time of waiting. The key to the next phase of growth, everyone agreed, was Syncrude — a much larger project that had been in the planning stages since the early 1960's. But when — if ever — would Syncrude finally clear all the hurdles and become a reality? In late 1971, the company and the Alberta government set August 31st, 1973, as the deadline for a final yes-or-no decision on the project.



Rita Callan



Harvie Christie

For the two years previous to Syncrude's "go" announcement, in spite of chronic uncertainty and constant conflicting rumors, the people of Fort McMurray prepared for the opportunities and problems that such a development would bring. While negotiations were being carried out between Syncrude and the provincial government, plans were being formulated to expand the living accommodation and services of the town.

By the time Syncrude's decision to proceed with the project was made public, the people of Fort McMurray had lived so long with the ups and downs of the situation that the actual announcement came as an anti-climax.

Chuck Knight, chairman of the town board, said "After all, we had watched the project see-saw back and forth for a number of years and were becoming quite cynical about any new developments. Then, when the announcement was finally made, it wasn't clear-cut but still had qualifications such as the federal tax problem and the labour problem attached. You really couldn't expect anyone to be overly excited about it. However, the town board did declare a civic holiday to provide something of a celebration".

The people of Fort McMurray, in the main, welcomed the announcement of the Syncrude project but they could

Denise Fortier

Jack Shields

also see that the project would bring problems.

David McNeilly, principal of the Dr. K. A. Clark Elementary School and former member of the town board, has mixed feelings about it.

"On the one hand," he said, "I was very pleased about the news. It will mean accelerated development of facilities the town really needs and possible new legislation to provide better services. There will be turmoil for two or three years during the construction period but once that is over and the plant is in operation, it should settle down to an improved situation."

As a school principal, Mr. McNeilly knows there will be a number of problems facing him when construction crews start moving in.

"The first year we were in operation, 1967, we had 425 students and a total of 450 transfers in and out of the school. It may happen again but it will be worth it."

The merchants and businessmen of the community were relieved to hear the decision was affirmative, according to Harvie Christie, sales manager for CJOK Radio. "It was kind of like the end of the war, but without the wild celebrations.

Everyone breathed a sigh of relief and then went on about their business. The announcement certainly has bred new life into the community. Hardly a day goes by but I call on a brand new business which has been established in Fort McMurray because of Syncrude".

Residents of the community and the area are pleased with the prospect of additional employment opportunities, according to Rita Callan, job counselor with the Outreach Program of the Metis Association. "The Metis Association feels good about the decision to proceed with Syncrude. It has to be advantageous to the town and will bring employment up for all residents of the area. The only problem will be with the number of people coming into the community and finding accommodation for them."

Some businessmen, and women, who established new stores and services because of their faith in the development of the tar sands believe they would have prospered even without Syncrude. Denise Fortier, manager of Andy's Sports and Guns (which she and her husband own), said they would have opened the retail outlet even if the decision had been negative.

Mrs. Fortier, who came to Fort McMurray in 1968 when her husband was appointed manager of the airport, is most concerned about the housing situation. "The decision is good for the town," she says, "but where are we going to put all the people who are supposed to be coming? Right now we not only don't have enough houses, we don't even have enough hotel and motel rooms."

Jack Shields, who was president of the Fort McMurray Chamber of Commerce at the time of the decision, sums it all up for the people of the area. "We KNEW," he says, "without a doubt that the tar sand development was going to proceed. Most of us had been making plans long before the decision was made and we just went right on with them. There wasn't much of a celebration, not because there wasn't something to celebrate, but because to us it wasn't a sudden revelation. We had believed firmly for many months that the decision would be 'go'."

ENVIRONMENT

It's an ecologically conscious time. People are confronted with the facts about the Syncrude Project — its reliance on surface mining, its diversion of Beaver Creek, its sheer size — and they ask: how is this thing going to affect our environment?

It's a reasonable question and in 1973 the company's environmental affairs group, created in 1972 to supervise environmental research and translate the results into firm environmental protection plans, had to find many of the answers.

Bob Simpson

The company's first major environmental research efforts dated back to 1970. In 1973 the main components of this research were completed and brought together in an Environmental Impact Assessment which was presented to the Alberta Department of the Environment on September 4th. This study, which weighed more than 12 pounds in four volumes, documented the impact of the project on the air, water and soil of the region and provided a wealth of basic information on the plant, animal, and human communities of Lease No. 17.

It was the first such study to be done in Canada, and was supplemented by four published environmental monographs brought out by Syncrude during the year and sent to biologists, ecology groups and others interested in environmental protection.

(Continued on Page 10)

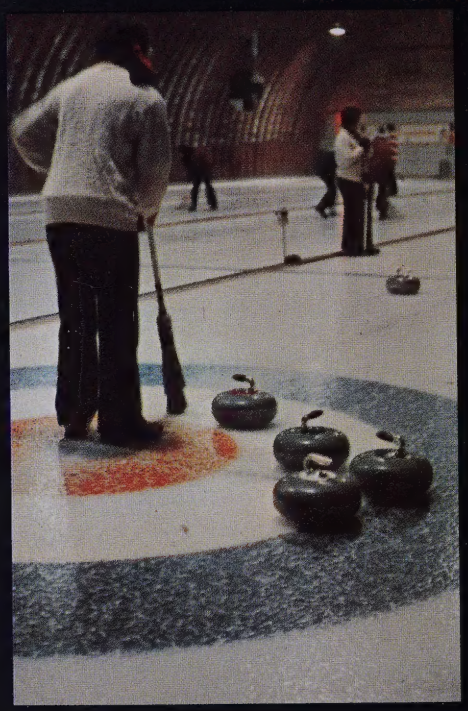
Artist's Conception of Reclaimed Area

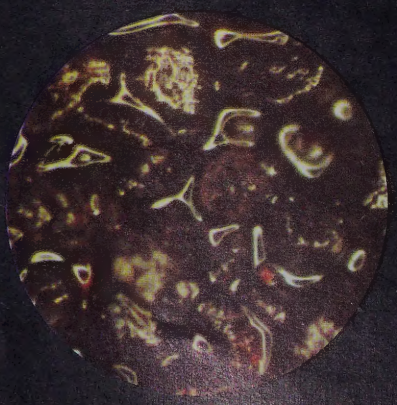
FORT McMURRAY

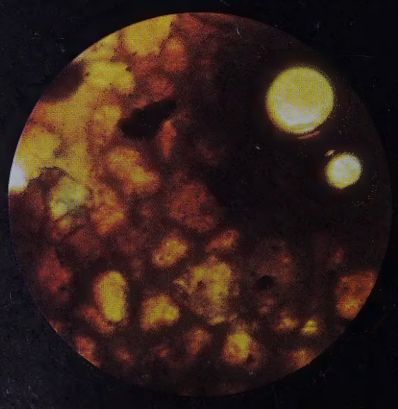
Fort McMurray came of age in 1973 with the decision to make Syncrude the second plant in the extensive development of the tar sands. With the expectation of an explosive increase in population to between 20,000 and 25,000 by 1978, the town has since become a scene of feverish activity.

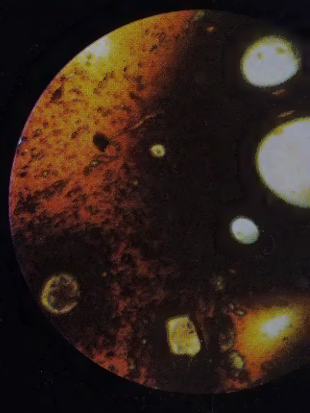
Within the townsite, new houses and apartment buildings are helping to ease the demand for accommodation while, on the surrounding escarpments overlooking the river valley, three new residential subdivisions are taking shape. Recreational facilities such as covered swimming pools, curling rinks, ice skating arenas and the golf course are scheduled for expansion and improvement. Construction is under way on new school buildings and on extensions to existing facilities. Retail services are expanding and modernizing present premises; new stores and shopping centres are scheduled to open.

Even this frantic pace will have to accelerate to provide to the new residents of Fort McMurray the 4,000 dwelling units and auxiliary services which are estimated to be required over the next four years.









Photomicrographs reveal the various stages of the process used by Syncrude to separate bitumen from sand.

From left to right they are:
Slurry, a mixture of tar sand and water.

The air contained in the slurry creates a froth . . .

. . . of air bubbles surrounded by bitumen, which floats to the surface.

The clean sand sinks to the bottom . . .

. . . along with minute amounts of colorful trace minerals.

ENVIRONMENT (Cont.)

(The four covered the habitat of Lease No. 17, ecological conditions in Beaver Creek, migratory waterfowl and an archeological survey of pre-historic Indian settlements in the area). "Making all this research data available to people at our own initiative was something of a first, and we're pleased to see that other companies are now starting to follow suit," said Ron Goforth, Syncrude's Director of Research and Environmental Affairs.

For Goforth, Environmental Co-Ordinator Jim Nalbach and the other members of the environmental affairs group, the highest priority of 1973 was to work with other groups in the company to incorporate the best possible environmental-protection features into the final engineering design of the Project — in Jim Nalbach's words, "so that we can avoid creating environmental problems in the first place, instead of going in afterward to clean up a mess that shouldn't have been made in the first place".

Along with three senior members of Syncrude's engineering department, Bob Connell, Sandy Cameron and Fred Friesen, the environmentalists were able to identify, and rectify, several potential environmental problems in the Project's design, including the design and use of a large 11 square-mile tailings pond. This pond must serve a dual function: it must contain the sand, clay and other tailings left over from tar sand oil extraction, at least until these tailings can be replaced in the mined-out area and used for reclamation; and it must also supply clean process water which can be recycled again and again through the extraction plant.

"It's important that the tailings pond not be regarded as a garbage-dump for the Project," said Goforth. "We see it instead as a feature — as environmentally clean as possible — that will permit us to recycle process water and avoid putting any contaminated water whatever into the Athabasca River. We want to confine all possible environmental effects to our Lease."

Nineteen seventy-three was a year of stepped-up contacts between the environmental group, the public, and the host of government agencies overseeing environmental aspects of the Project. By year-end, Syncrude had applied for and received some 30 permits, had provided reams of environmental data and research material to various government agencies, and had held a "citizens' environmental forum" in Fort McMurray to give local residents an opportunity to air their environmental concerns.

Re-Vegetation Test

In addition, additional environmental studies were underway to explore the climate, hydrology (ground water), natural revegetation and fish spawning of the area. As these studies are completed, the results will be made public.

Already the studies have added greatly to public knowledge about the environment of a part of the province that had, prior to 1973, not been heavily studied.

Some of the findings contained surprises: one study found that the natural levels of sodium chloride, threshold odor and heavy metals in certain local creeks are higher than the provincial government's "allowable" levels — leading one bemused researcher to wonder whether mother nature should be declared a polluter!

Syncrude operated two fully instrumented ground weather monitoring stations, located east and northwest of the site where the plant will be built. These weather stations, which Syncrude environmentalist Phil Lulman must visit on ski-doo during the seven months of winter, will give Syncrude (and the public) a much clearer picture of local weather conditions (wind, ice fog, etc.) that have a potential environmental effect.

In a year of many environmental "firsts" for the company, there were two others of importance. Syncrude's environmental co-ordinator, Jim Nalbach, was instrumental in the formation, in March, of a seven-company research group, the Oil Sands Environmental Studies Group, to underwrite industry-wide environmental studies.

And by year-end, Syncrude's two-man environmental field workers, Phil Lulman and Bob Simpson, were on site north of Fort McMurray, working with construction crews and contractors to assist in the enforcement and observation of government environmental guidelines.

One of Lulman's first tasks in 1974 will be to rope off an ancient limestone quarry, used hundreds of years ago by Indians as a source of stone for arrowheads, and discovered in the course of the company's archeological survey in 1973. Thus protected, the site can be preserved from damage until archeologists have an opportunity to study its contents in the summer of 1974.

Typical Tar Sands Terrain

DISCOVERIES

Water, Water Everywhere

The tar sands have a way of keeping developers humble. Over the years, back to the turn of the century, various entrepreneurs, scientists and investors thought they had found the answers to successful production of oil from the sands — only to discover, the hard way, that they still had much to learn.

Syncrude has been doing research and development work in the tar sands since 1959; but during 1973 Syncrude, too, discovered much about this unique natural resource.

One of these discoveries took place on the morning of March 21st when Ed Thomas, an engineer employed by Syncrude's managing contractor at the mining test pit north of Fort McMurray, first noticed more than 20 gallons a minute of salty water pouring from the pit wall.

The water was flowing from underground pressure through an instrumentation hole that had been bisected by Syncrude's dragline, about 60 feet below the ground.

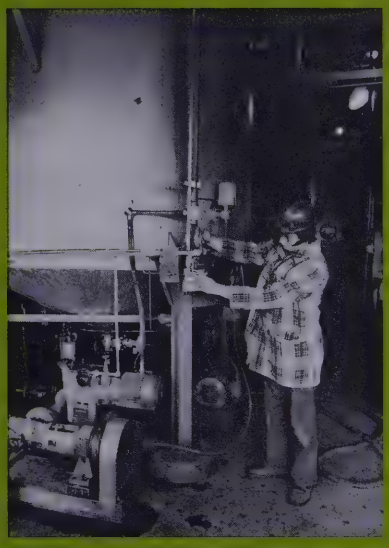
Syncrude's mining engineers became very concerned about the discovery because it raised the possibility that such aquifers (as these underground streams are called) could weaken the slope and ultimately make it impossible to use draglines for mining the tar sands. To a mining engineer, aquifers are bad news.

In the coming months, intensive efforts were made to try and learn more about this underground water. Where was it coming from? Would it constitute a problem throughout the area Syncrude planned to mine once the full-scale commercial project begins operations? Could the water be drawn off by wells and pumps, to leave the mining area dry?

Mine Test Pit

The test pit was ringed with a pumping system which worked 24 hours a day for several months to try and "draw down" the water. Gradually the level dropped, and the pit was dried out. But it was obvious from this discovery that mining in the tar sands would require even more planning and inventiveness than had been anticipated.

Saving the oil



Marrien Chudyk and the Dilution Centrifuge at Our Pilot Plant

There's a lot of potential oil production in Alberta's tar sands — perhaps 300 billion barrels worth, in the long run — but getting it out is expensive and complex. And some of the proven techniques for getting it out don't recover all of the oil.

Could these oil losses be reduced to absolutely minimal levels? This was one of the assignments in 1973 of Syncrude's research group, operating at the company's laboratories and pilot plant in east Edmonton.

There were two problems to explore. The long-developed Clark hot water extraction process doesn't work with equal efficiency on all types of tar sand — tar sand with a high clay content presents special problems. Syncrude's researchers had to explore ways of improving the hot water process so that it could extract as much bitumen (as the heavy oil in tar sands is called) as possible from all types and grades of tar sand likely to be found in the Syncrude mine. "One thing that few people understand is that not all tar sand is the same," said research director Ron Goforth, who holds a PhD. from the University of Alberta in Edmonton. "Some tar sand has very little clay, some has up to 25% clay. And it all processes differently."

The second problem tackled by the research group was oil losses normally sustained when the dirty bitumen froth, extracted from the tar sand, is cleaned. The cleaning process involves dilution of the froth with naphtha, followed by processing through centrifuges. There is a tendency for some of the bitumen and naphtha to be lost in this process and to pass into the tailings disposal area. "This could be bad both environmentally and economically," said Syncrude research engineer Ken Porteous. "If we can find ways to reduce these losses — and we think we have — we can have a cleaner operation and recover more of the hydrocarbon as well."

In order to reduce extraction losses, the research group conducted extensive tests during the year in its pilot extraction system which is capable of processing 15 tons of tar sand an hour. On the basis of processing some 27,000 tons of tar sand, hauled to the pilot plant by truck from north of Fort McMurray, Syncrude extraction and froth treatment manager Bill Lavender said the final extraction design will prove "significantly more reliable than any presently operating plant" with widely varying grades of tar sand.

Rod Erker at the Dilution Centrifuge Control Panel Within Our Pilot Plant

Dilution centrifuging tests in 1973 took place in a $1 million dilution centrifuging pilot plant built especially for the purpose. The plant, designed and supervised by Lavender, and researchers Ted Kezior, Ken Porteous, and Rob Schutte, led to significant findings with respect to reduction of hydrocarbon losses and operating costs.

At the peak of activities in 1973, there were 107 people employed in Syncrude's Edmonton research operations and, as Ron Goforth said, "we don't have all the answers yet, but in 1973 we certainly pried the door open and let in a lot more light."

DECISIONS

To Build or Not to Build?

The summer of 1973 brought Syncrude and its four owner companies — Imperial Oil, Gulf Oil Canada Ltd., Atlantic Richfield Canada Ltd. and Canada-Cities Service Ltd. — face to face with the biggest decision in the fourteen year history of the Project: whether or not to proceed into construction. Twice earlier in 1962 and 1969, Syncrude had been anxious to proceed but was held back by government caution. Now, in mid-1973, the basic conceptual engineering on the project had been completed and the final, intensive negotiations were underway with the Alberta Government to try and reach agreement on economic groundrules under which the Project could operate.

As engineering work and cost estimates became more definitive, the projected price of the project soared. As late as 1971, it seemed construction of the project would cost perhaps $500 million. But rising construction costs, material shortages, and firmer engineering concepts combined by mid-1973 to produce a construction cost estimate of almost $1 billion for the plant alone (not including the utilities complex and new pipelines). This would make it not only one of the largest construction projects in recent Canadian history, but also one of the riskiest. Syncrude's executive vice-president Brent Scott listed the risks: "We are bound to encounter shortages of construction workers and materials, and uncertain delivery dates on major components. We'll have difficulties building and operating extremely large pieces of equipment in a northern climate. Some of our components, like the fluid cokers, will be the largest ever built. We'll have an untried and immensely complicated mining system, and everything else will depend on it. And we face unstable tax, royalty, environmental and other policies of government."

Was the project feasible from an engineering standpoint? Would it yield an attractive profit — or indeed, any profit at all? As negotiations wore on between Syncrude's participants and representatives of the Alberta Government, tension grew. Could an agreement be reached which would satisfy the concerns of the investor, and also satisfy the legitimate wishes of government to extract maximum revenue from the Project?

Meeting followed meeting. Royalty formulae were devised, then torn up to start again. As the mutually-agreed deadline of August 31st loomed, progress was evident but agreement had not yet been reached.

A postponement to September 17 was agreed upon. On September 18, more than 200 Syncrude families and friends met in Edmonton's Chateau Lacombe hotel to watch Alberta Premier Lougheed announce over television, to a province-wide hookup, that a tentative agreement had been reached to proceed with the project. The complex agreement provides that the Government will receive 50% of all net profits from the Project as a "joint venture" partner, and that Albertans will be enabled to purchase 20% of the Project (and 50% of the utilities complex and 80 % of the pipeline) in order to assure strong local, Canadian financial participation.

"We think a very hard bargain was driven by the Province," said Syncrude President Frank Spragins.

"Why did we go along with it? I think it was because our participants felt that there was enough hope of higher, more realistic oil prices in future, plus an opportunity to learn from this first plant and use the knowledge to build more advanced plants in future. If we were to be limited to building just this one plant, with its projected low rate of profit, I doubt that we would have gone ahead with it. But as it stands, we're moving into construction at last, and it's very satisfying to see the project finally becoming a reality. It's been a long dream."

Draglines or Bucketwheels? The Mining Decision

If the biggest decision in 1973 for Syncrude's owner companies was the "go/no-go" decision, the biggest decision for Syncrude itself was the selection of a mining system. Syncrude is a mining venture — but a mining venture on the largest scale ever seen in Canada. The Syncrude mine will have a design production rate of 13,500 tons of tar sand an hour (or about five times Canada's hourly coal production in 1970).

Mining in the tar sands is notoriously difficult. The tar sand is abrasive and sticky, and wears out metal parts. In mid-winter, intense cold down to -50 degrees causes metal to become brittle and men to work less efficiently, and the tar sand freezes to rock-like consistency. How could Syncrude mine such enormous tonnages in such difficult conditions?

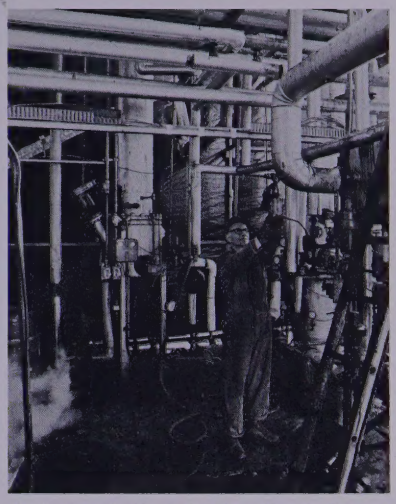
Syncrude's search for the best possible mining system went on all through the 1960's and early 1970's, and involved a host of mining engineers and consultants with world-wide experience. By early 1973, Syncrude's Ernie Pitschel, assistant general manager (projects) and his group had examined and discarded 55 possible mining systems using every kind of equipment from dredges to power shovels to scrapers, all in various combinations. The choice for the company had narrowed to two types of equipment: giant bucket-wheel excavators of the kind used by

Artist's Conception of the Mine Site

Great Canadian Oil Sands Ltd., and pioneered in the soft coal fields of Germany; or giant electrically-powered draglines developed in the coal industry in North America.
The choice between these two schemes would have enormous economic implications. As Pitschel put it, "it could quite literally make the difference between a profitable project and an unprofitable one. I have seen companies that selected the wrong mining scheme and paid the price for years. One I can think of went bankrupt."
Draglines seemed to offer several important advantages. Tests with Syncrude's 17 cubic yard dragline at the mining test pit near Beaver Creek (see "Discoveries") during the winter of 1972-73 indicated the dragline could cut frozen tar sand and, in the mind of Dave Adam, the company's project manager: mining, "we learned a lot from Li'l Beaver about how a commercial-sized dragline should be designed for successful operation in the tar sands."
But there was a giant-sized question mark above the giant-sized draglines. Would a tar sand mining face more than 100 feet high support such enormous machines, (weight: 11,000,000 pounds apiece) without collapsing?
All through 1973 Pitschel's group wrestled with this decision. Several groups were called upon for help: local consulting soils engineers in Edmonton; a panel of international soils experts; and mining experts from Syncrude's parent companies and Canadian Bechtel Limited, the company's managing contractor. Sites as far away as West Germany, Labrador and Florida were visited for information. And as this was happening, the Syncrude test dragline, under the supervision of Dave McSkimmings, was digging deeper and deeper, finally excavating almost 2.5 million cubic yards of material in its search for knowledge about the structure of the tar sands. (see "Discoveries").
In early November, Pitschel's group came to a conclusion: with certain precautions and appropriate design, draglines looked acceptable. On November 27 Syncrude's executive committee approved this decision and by year-end the first draglines had been ordered from suppliers.

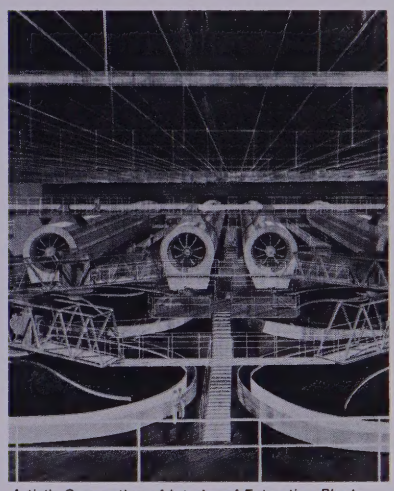
Getting the Gunk out

Few people are really ready for bitumen. They hear the term "oil sands": they expect to see liquid crude oil. They're not prepared for the smelly, sticky, viscous stuff that oozes out of the sands during extraction.



Martin Yarko Working in Pilot Plant Naphtha Recovery Unit

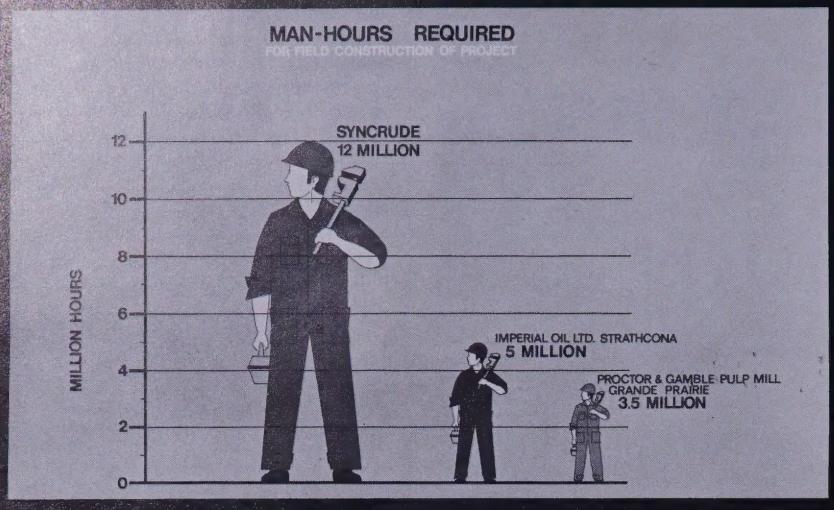
In 1973, one of the most important assignments of Syncrude's engineering department was to finalize the most efficient way of removing the impurities from bitumen and transforming it into high-grade synthetic crude oil.
In 1972, Syncrude had adopted the patented fluid coking technology developed by Esso Research and Engineering as a first stage in bitumen upgrading. In fluid coking, the heavy bitumen will be sprayed into a fluidized bed of hot coke particles at more than 900 degrees fahrenheit; this will "crack" the bitumen molecules and produce gases, a liquid distillate and fluid coke (which Syncrude will stockpile, for environmental reasons). Said Ron Gray, Syncrude's engineering director, "our big problem was trying to determine how to take the sulphur and nitrogen impurities out of that distillate, convert some of the less desirable hydrocarbons, stabilize it, and make it into synthetic crude."
Over the years the oil industry developed a process to treat heavy oils: called hydrotreating, it involved reacting the oil with hydrogen under moderate temperatures, high pressures, and in the presence of a catalyst. The chemical changes induced in this reaction draw off impurites like sulphur and nitrogen in the form of hydrogen sulphide and ammonia and saturate unstable compounds. "Unless you do this, the distillate will form jellies and gums that will gunk up a plant or a pipeline," said Harold Wiggers, Syncrude's manager of process engineering.
But would Syncrude's bitumen distillate, higher in metals and other impurities, than normal oil, work with conventional hydrotreating? Process engineers Wiggers, Walter Prior (a veteran of 41 years experience in refining with Imperial Oil) and Al Hyndman were responsible for finding out. "Hydrotreating had been around as a process for a long time, but no one knew how best to adapt it to our unique bitumen product," said Prior.
Deadlines loomed. There was a need to get answers and finalize the design of Syncrude's hydrotreaters by the autumn, so that orders could be placed for hydrotreater components. The engineering group mounted tests in two separate installations at Baton Rouge, Louisiana and Avon, California, in conjunction with Esso Research and Engineering. The problems proved to be difficult requiring application of the latest advances in technology to achieve resolution, but by July 15th Ron Gray could say, "we got our answers and we got them on time."



Artist's Conception of Interior of Extraction Plant

Building the Syncrude Project

Many men in Syncrude face challenges; probably none faces more difficult challenges than Chuck Collyer, vice-president and general manager — projects. Collyer is responsible for seeing that the Syncrude project is built on time and within the budget — and in a world of labor shortages, inflation, uncertain equipment deliveries and awesome competition with other major construction projects for men and materials, it's a tall responsibility.



Collyer and his colleagues in Syncrude's Projects department are paid to look at problems without flinching. He says bluntly: "The complexities of Syncrude's job are more difficult than any previous Canadian construction project." Syncrude compares with the Churchill Falls power project or the St. Lawrence Seaway in construction cost. It is probably more complex than either, because of the advanced technologies and components that must be built and brought together for the production of synthetic crude oil. It will mean bringing together men, capital, know-how and materials not only from across Canada but from many countries around the world. It will mean supplying a camp for 3,000 construction workers, and permanent housing for 1,600 Syncrude employees, plus their families, in Fort McMurray.

"The problem," says Collyer, "is that many of the construction workers and much of the building material and plant components that we will need are also needed in other projects. The James Bay power project will need them. The Alaska pipeline will need them. Refineries, atomic power plants and coal gasification projects now underway in the U.S. will need them. We have to compete with all of these enterprises."

The "go" decision on the Project in September, 1973, meant the race against time was on. And while 75% of the total dollars to be spent on building the project will be spent in Canada, the international demand for certain specialized components dictated that Syncrude had to place some foreign orders immediately or risk losing them altogether.

Collyer sites the difficulty the company faced in trying to find a metal fabricator capable of meeting Syncrude's order for giant reactor vessels. These vessels will be more than 100 feet long and must have steel walls six inches thick, rolled and welded to incredibly precise specifications. Only five fabricators in the world were capable of building such vessels, one in Japan, two in Europe, two in North America. Of the five, only one — in Italy — was capable of taking the order because of other commitments.

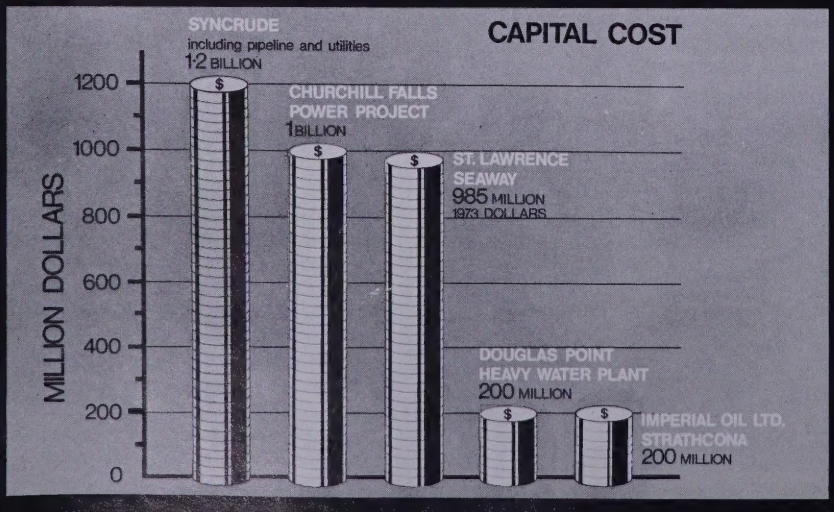
"If we had arrived at his doorstep a week later we would have been out of luck," said mechanical engineering manager Bill Mowat.

Syncrude faced similar problems in the delivery of other components as well. Only two dragline manufacturers were capable of meeting Syncrude's requirements for the huge mining machines; and both had received more orders in recent months than in five previous years.

In the face of these challenges, Syncrude had, by year-end, nevertheless committed $125 million worth of orders for materials, equipment and subcontracts. And much larger expenditures were yet to come. Estimated total construction cost for the project itself (not including utility plant and pipelines) is $1 billion.

"The material and equipment problem is only one problem we face," said personnel director Don Scott. "Two of the others are hiring skilled personnel and finding housing in Fort McMurray. Our five-year projection shows McMurray doubling in size from its present 10,000 people. We've got to build a lot of houses and aim for an urban community with good services for all the people."

By the end of the year Syncrude and its contractors had 200 men on site, 25 miles north of Fort McMurray. The first stage of a camp to provide sleeping, eating and recreational facilities for construction workers was moving toward completion and, outside, machinery was digging drainage ditches and removing frozen muskeg from the ground in preparation for foundation pouring in the spring of 1974.



A note to the reader

This year, at Syncrude, we're making a strong effort to provide information about our company in quite a different way. We hope to give you, the reader, some feeling for what our company did in 1973, and what it was like to be a part of our organization during that very eventful year.

We obviously couldn't cover everything in this limited space. But we've tried to cover the highlights of the year.

If you still have questions when you're finished reading this report, why not get in touch with us? We want you in on what we're doing.

The Editor

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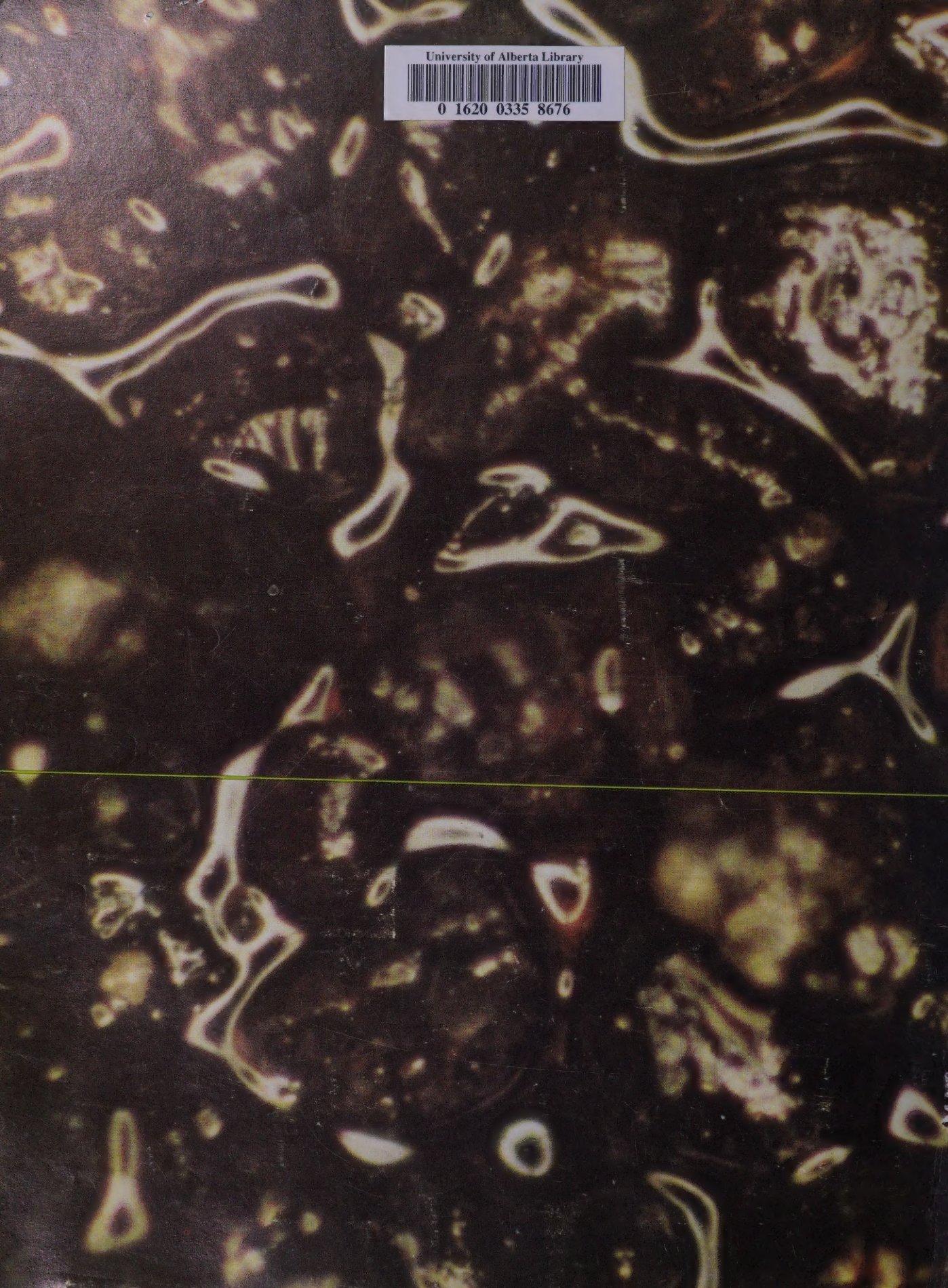
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